

CLAIMS

What is claimed is:

1. A method for recovering data from a redundant storage object, comprising:  
detecting an error in a data image, during a read of the data image from the redundant storage object;  
establishing an index for monitoring the retrieval of a specific copy of the data image and keeping a log of all copies retrieved to ensure that redundancy in the error check of the specific copies is avoided;  
sending a first command, to the redundant storage object, requesting a copy of the data image until the response from the redundant storage object indicates that the requested copy does not exist;  
retrieving the copy of the data image from the redundant storage object when the copy exists;  
incrementing the index;  
determining if an error exists in the copy of the data image retrieved; and  
re-writing the data image with the copy of the data image that is determined to be errorless and continuing processing of the redundant storage object.
2. The method of claim 1, further comprising the step of initiating an unrecovered error handler if no copy of the data image is found in the redundant storage object.
3. The method of claim 2, further comprising the step of sending an incorrect data image back to the redundant storage object after an error is detected in the data image read from the redundant storage object, checking the incorrect data image against all existing copies of the data image, and determining if a copy of the data image exists which differs from the incorrect data image.

4. The method of claim 3, wherein the steps of the method are executed on an underlying component of the Input/Output path of the redundant storage object.
5. The method of claim 1, wherein the redundant storage object is selected from the group consisting of a redundant array of independent disks, volume manager in the host system software, or filer head.
6. The method of claim 5, wherein the redundant array of independent disks further comprises an array controller.
7. The method of claim 1, wherein the method is executed by a computing system in communication with the redundant storage object.

8. A method for recovering data from a redundant storage object, comprising:
  - detecting an error in a data image, during a read of the data image from the redundant storage object;
  - sending a first command, to the redundant storage object, requesting a count of copies of the data image that exist in the redundant storage object;
  - establishing an index for monitoring the retrieval of a specific copy of the data image and keeping a log of all copies retrieved to ensure that redundancy in the error check of the specific copies is avoided;
  - determining if the count of copies of the data image that exist in the redundant storage object equals the index;
  - sending a second command, to the redundant storage object, when the count is greater than the index, requesting the copy of the data image;
  - retrieving the copy of the data image from the redundant storage object when the copy exists;
  - incrementing the index;
  - determining if an error exists in the copy of the data image retrieved by the second command; and
  - re-writing the data image with the copy of the data image that is determined to be errorless and continuing processing of the redundant storage object.
9. The method of claim 8, further comprising the step of initiating an unrecovered error handler if the count of copies of the data image in the redundant storage object is equal to the index;
10. The method of claim 9, further comprising the step of sending an incorrect data image back to the redundant storage object after an error is detected in a data image read from the redundant storage object, checking the incorrect data image against all existing copies of the data image, and determining if a copy of the

data image exists which differs from the incorrect data image.

11. The method of claim 10, wherein the steps of the method are executed on an underlying component of the Input/Output path of the redundant storage object.
12. The method of claim 8, wherein the redundant storage object is selected from the group consisting of a redundant array of independent disks, volume manager in the host system software, or filer head.
13. The method of claim 12, wherein the redundant array of independent disks further comprises an array controller.
14. The method of claim 8, wherein the method is executed by a computing system in communication with the redundant storage object.

15. A method for recovering data from a redundant storage object, comprising:  
sending an incorrect data image back to the redundant storage object after an error is detected in a data image read from the redundant storage object, requesting a check against all existing copies of the data image in the redundant storage object, and determining if a copy of the data image exists which differs from the incorrect data image;  
sending a get redundancy count command that retrieves a count of copies of the data image stored in the redundant storage object, establishes an index, and determines if the count is equal to the index; and  
sending a read redundancy data command, when the count is greater than the index, requesting a copy of the data image until the response from the redundant storage object indicates that the requested copy does not exist, retrieving a copy of the data image, determining if an error exists in the copy of the data image, re-writing the data image with the copy of the data image which is found to be errorless, and continuing processing of the redundant storage object.
16. The method of claim 15, further comprising the step of initiating an unrecovered error handler if the count of copies of the data image stored in the redundant storage object is equal to the index;
17. The method of claim 16, wherein the steps of the method are executed on an underlying component of the Input/Output path of the redundant storage object.
18. The method of claim 15, wherein the redundant storage object is selected from the group consisting of a redundant array of independent disks, volume manager in the host system software, or filer head.

19. The method of claim 18, wherein the redundant array of independent disks further comprises an array controller.
20. The method of claim 15, wherein the method is executed by a computing system in communication with the redundant storage object.

21. A computing system for recovering data from a redundant storage object, comprising:
  - a host computer assembly in communication with the redundant storage object, the host computer assembly reading a data image from the redundant storage object and determining the data image contains an error;
  - a first command sent by the host computer assembly to the redundant storage assembly, the first command retrieves a count of copies of the data image stored in the redundant storage object, establishes an index, and determines if the count equals the index; and
  - a second command sent by the host computer assembly to the redundant storage assembly, when the count is greater than the index, requesting a copy of the data image until the response from the redundant storage object indicates that the requested copy does not exist, retrieving a copy of the data image, determining if an error exists in the specific copy of the data image, re-writing the data image with the copy of the data image which is found to be errorless, and continuing processing of the redundant storage object.
22. The computing system of claim 21, further comprising an unrecovered error handler being initiated if the count of the number of copies of the data image in the redundant storage object is equal to the data image;
23. The computing system of claim 22, further comprising a third command for sending an incorrect data image back to the redundant storage object after an error is detected in a data image read from the redundant storage object, checking the incorrect data image against all existing copies of the data image, and determining if a copy of the data image exists which differs from the incorrect data image.

24. The computing assembly of claim 23, wherein the functions performed by the computing assembly are executed on an underlying component of the Input/Output path of the redundant storage object.
25. The computing system of claim 21, wherein the redundant storage object is selected from the group consisting of a redundant array of independent disks, volume manager in the host system software, or filer head.
26. The computing system of claim 25, wherein the redundant array of independent disks further comprises an array controller.